

REMARKS

Applicants note with appreciation that, in the Office Action dated April 8, 2005, claim 10 was allowed and claims 2, 5 and 8 were objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, claims 1, 3, 4, 6, 7, 9 and 11 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable in view of U.S. Patent No. 6,323,858 B1 ("Gilbert et al."), U.S. Patent No. 5,023,725 ("McCutchen"), U.S. Patent No. 6,335,754 B1 ("Endo et al.") and/or U.S. Patent No. 6,445,814 B2 ("Iijima et al."). Furthermore, claim 8 was objected to because of an informality.

In response, Applicants have rewritten the "objected to" claims 2, 5 and 8 in independent form as new claims 30, 31 and 32, respectively, with changes to correct minor informalities. As a result, claims 2, 5 and 8 were canceled, as well as claims 4, 6 and 7. Consequently, the objection to claim 8 is now moot. Applicants have also amended the allowed claim 10 to correct minor informalities. In addition, Applicants have amended the independent claims 1, 9 and 11 to more clearly distinguish the claimed invention from the cited references, as explained below. Furthermore, Applicants have added a new independent claim 26 and new dependent claims 12-25 and 27-29.

In view of the amendments to the claims and the following remarks, Applicants respectfully request the allowance of the pending claims 1 and 9-32.

A. Patentability of Amended Independent Claim 1

The Office Action has rejected the original independent claim 1 under 35 U.S.C. §103(a) as allegedly being unpatentable over Gilbert et al. in view of McCutchen and further in view of Endo et al. In response, Applicants have amended claim 1 to more clearly distinguish the claimed invention from the cited references.

As amended, claim 1 recites in part "*a plurality of multi-camera modules positioned along the direction of height, each of the multi-camera modules including multiple cameras that are arranged such that the optical centers of the multiple cameras are in a plane, the multiple cameras of the multi-camera modules being further arranged such that the optical axis of at least one of the multiple cameras from a first multi-camera module of the multi-camera modules at a first height is pointing in the same direction as the optical axis of at least one of the multiple cameras from a second multi-camera module of the multi-camera modules at a second height such that the optical axes are parallel.*"

To establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), the following three basic criteria must be met, as set forth in MPEP §2143:

"First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations."

The Office Action alleges that "McCutchens also teaches the multi-camera module are vertically stacked and formed in at least two layers in the direction of height." Applicants respectfully disagree.

The cited reference of McCutchen discloses a dodecahedral environmental photography and projection system. In Fig. 19 of McCutchen, a portable compound video camera with eleven modules and a contour grip, capable of covering nearly a spherical field of view, is shown. In column 20, lines 48-51, of McCutchen, the modules of the video camera is described as being "locked together by means of dog connectors 96" and that "[a] maximum of eleven modules can be grouped together this way." Thus, these modules are treated as individual parts that are grouped as a single unit, and cannot be arbitrarily grouped as "*multi-camera modules*". Consequently, the cited reference of McCutchen does not teach "*a plurality of multi-camera modules positioned along the direction of height, each of the multi-camera modules including multiple cameras that are arranged such that the optical centers of the multiple cameras are in a plane, the multiple cameras of the multi-camera modules being further arranged such that the optical axis of at least one of the multiple cameras from a first multi-camera module of the multi-camera modules at a first height is pointing in the same direction as the optical axis of at least one of the multiple cameras from a second multi-camera module of the multi-camera modules at a second height such that the optical axes are parallel.*"

are arranged such that the optical centers of the multiple cameras are in a plane," as recited in the amended claim 1. Therefore, even assuming arguendo that the teachings of Gilbert et al. and McCutchen are combined, the cited references when combined do not teach all of the limitations of the amended claim 1.

Even assuming that McCutchen teaches the claimed limitation of "*a plurality of multi-camera modules positioned along the direction of height.*" The optical axes of the modules of the McCutchen video camera radiate from the center of the dodecahedral video camera, as illustrated in Fig. 2 of McCutchen. Consequently, no two optical axes of the McCutchen modules are pointing in the same direction such that they are parallel. Thus, McCutchen does not teach, "*the multiple cameras of the multi-camera modules being further arranged such that the optical axis of at least one of the multiple cameras from a first multi-camera module of the multi-camera modules at a first height is pointing in the same direction as the optical axis of at least one of the multiple cameras from a second multi-camera module of the multi-camera modules at a second height such that the optical axes are parallel*" (emphasis added), as recited in the amended claim 1. Therefore, even if the cited references of Gilbert et al., McCutchen and Endo et al. are combined, the cited references when combined do not teach all of the limitations of the amended claim 1.

As stated above, the optical axes of the modules of the McCutchen video camera radiate from the center of the dodecahedral video camera. Thus, the optical axes of the McCutchen video camera are pointing in different directions. Similarly, Gilbert et al. discloses a digital image capturing device (10) having six lenses (41a-41f) positioned on the six sides of a cube shaped frame (10a). The optical axes of the six lenses also radiate from the center of the cube shaped frame, pointing in different directions. Thus, even if there is some motivation to combine the teachings of Gilbert et al. and McCutchen, the resulting device should obviously have optical axes pointing in different directions. Applicants note here that there is no suggestion or motivation to modify the digital image capturing device of Gilbert et al. to include another layer of lenses, such as the lenses

(41a-41d), because such a modification would render the digital image capturing device of Gilbert et al. unsatisfactory for its intended purpose.

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. (See *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP §2143.01). The intended purpose of the digital image capturing device of Gilbert et al. is to capture a spherical panorama. (See Abstract; column 2, lines 14-21; column 2, lines 31-34; column 5, lines 59-64; column 11, lines 51-61). If the digital image capturing device of Gilbert et al. is modified to include another layer of lenses, such as the lenses (41a-41d), the optical axes of the lenses in the additional layer cannot radiate from the center of the cube shaped frame as the optical axes of the original lenses, which make the modified device undesirable to capture a spherical panorama. Thus, there is no suggestion or motivation to modify the digital image capturing device of Gilbert et al. in such a manner.

Because of the above reasons, Applicants respectfully assert that the amended independent claim 1 is not obvious in view of the cited references, and request that this claim be allowed.

B. Patentability of Amended Independent Claim 11

Similar to the original independent claim 1, the original independent claim 11 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Gilbert et al. in view of McCutchen and further in view of Endo et al. In response, Applicants have amended claim 11 to more clearly distinguish the claimed invention from the cited references.

As amended, claim 11 recites in part "*an elevator for elevating the multi-camera module vertically.*" None of the cited references teaches such a limitation. Therefore,

Applicants respectfully assert that the amended independent claim 11 is not obvious in view of the cited references, and request that this claim be allowed.

C. Patentability of Amended Independent Claim 9

The original independent claim 9 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over McCutchen in view of Iijima et al. In response, Applicants have amended claim 9 to more clearly distinguish the claimed invention from the cited references.

As amended, claim 9 recites in part "*searching corresponding points in one of the first images and in one of the second images.*" As claimed, the first images are acquired "*using at least some of the multiple cameras with the optical centers in a first plane at a first height to acquire the first images*" and the second images are acquired "*using at least some of the multiple cameras with the optical centers in a second plane at a second height.*" McCutchen does not teach or suggest such a claimed limitation. Therefore, even assuming arguendo that there is a valid motivation or suggestion to combine the teachings of McCutchen and Iijima et al., each element of the amended claim 9 is not taught or suggested. Therefore, Applicants respectfully assert that the amended independent claim 9 is not obvious in view of the cited references, and request that this claim be allowed.

D. Patentability of New Independent Claim 26

The new independent claim 26 recites a method for acquiring 3-dimensional data. The method of claim 26 comprises:

"acquiring first images using a multi-camera module comprising multiple cameras at a first location, the optical centers of the multiple cameras being in a plane;
moving the multi-camera module from the first location to a second location;
acquiring second images using the multi-camera module at the second location;

*searching corresponding points in at least one of the first images
and in at least one of the second images;
extracting distance information for the corresponding points using
trigonometry; and
acquiring 3-dimensional data based on the distance information."*

The cited references do not disclose each element of the new independent claim 26. As such, Applicants respectfully assert that the new claim 26 is neither anticipated nor obvious in view of the cited references, and request that this claim be allowed.

C. Patentability of Dependent Claims 12-25 and 27-29

Each of the dependent claims 12-25 and 27-29 depends on one of the independent claims 1, 9, 11 and 26. As such, these dependent claims include all the limitations of their respective base claims. Therefore, Applicants submit that these dependent claims are allowable for at least the same reasons as their respective base claims.

Applicants respectfully request reconsideration of the claims in view of the claim amendments and the remarks made herein. A notice of allowance is earnestly solicited.

Respectfully submitted,

Lee et al.

Date: October 7, 2005

By: Thomas H. Ham
Thomas H. Ham
Registration No. 43,654
Telephone: (925) 249-1300